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ECONOMIC COMMISSION FOR ASIA AND THE FAR EAST

CAMBODIA, LAOS, THAILAND AND VIET-NAM

Committee for Coordination of Investigations
of the Lower Mekong Basin

MEKONG PROJECT

Public Health in Mekong Basin: Malaria Control

The Executive Agent of the Mekong Committee has the honour to submit herewith for information copies of the following:

..... 1. Documents: WPR/MAL/FR/46 "Reports on Field Visits to Laos"
WPR/MAL/FR/66 "Report on a Field Visit to Cambodia"
WPR/MAL/FR/65 "Report on a Field Visit to Viet-Nam"
"New Nomenclature for Country Malaria Eradication Projects"
"Minimum Provisions of an Acceptable Plan for Malaria Eradication"

..... 2. Letter of 29 August 1961 from the Mekong Committee Executive Agent to the Regional Director of Regional Office for the Western Pacific/World Health Organization (WPRO/WHO)

..... 3. Letter from the Regional Director of WPRO/WHO to the Mekong Committee Executive Agent dated 14 September 1961

4. Letter of 12 December from the Mekong Committee Executive Agent to Dr. I.C. Fang.

W O R L D H E A L T H
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WPR/MAL/FR/46
23 September 1960

ORIGINAL : ENGLISH

REPORT ON FIELD VISITS TO LAOS

by

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Contents

		Page
1.	Purpose of visit	2
2.	Background information	2
2.1	General description of the country	2
2.2	The anti-malaria service	3
2.3	Entomological information	4
2.4	Organization and personnel	7
3.	Summary of discussions	7
3.1	Present situation of malaria	8
3.2	Difficulties encountered in the present anti-malaria programme	9
3.3	WHO assistance	10
3.4	Administrative matters	14
4.	Summary and recommendations	15
Annex I	: Organization and Personnel	17
Annex II	: Summary of Distribution of Houses	20
Annex III	: USOM Budget	
Annex IV	: Map of Laos	

Distribution

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1. PURPOSE OF VISIT

1.1 To attend the malaria eradication conference at Pakse. (Report will be issued by the secretary of the Anti-malaria Co-ordination Board).

1.2 To assess the present status of the malaria programme in Laos in order to discover in which way WHO could best assist in transforming the present malaria programme into one of eradication. A Government request for assistance was received on 9 June 1960.

2. BACKGROUND INFORMATION

(Based largely on information supplied by the National Malaria Service)

2.1 General description of the country

(a) Area in square miles: 91,000 (in square kilometres - 235,690)

(b) Population (1958 estimate): 2,000,000-2,500,000.

(c) Political divisions of the country: provinces, districts, sub-districts, cantons and villages.

(d) Topography: North or Upper Laos is composed of wooded slopes and plateaux cut by narrow valleys and gorges; Lower Laos, of arid limestone terraces, sparsely forested descending westwards to the Mekong River from the central mountain ranges which divide Laos from Central Viet-Nam.

(e) Climate: The rainfall is up to 80 inches and the rainy season is from the middle of May to the middle of October.

Temperature: November to February, cool dry season; February to May, hot dry season. Maximum temperature: 100°F, minimum 48°F.

(f) Communication: There are no railways. The most important road extends 932 miles from Luang Prabang to Saigon. At the moment it is impassable between Savannakhet and Vientiane. The Mekong River is navigable for the 312 miles between Vientiane and Savannakhet.

(g) Production: Rice, maize, tobacco, cotton, coffee; cattle raising, lumbering, tin mining, etc.

Most of the villages are very scattered; the distance from one village to another often exceeds ten kilometres.

(h) Housing conditions: In the large towns, many of the houses are of concrete, bricks reinforced with steel or massive masonry with mortar finish. Some are of wooden framework.

In the rural areas the houses vary with the sizes of the village, a reflection of the economic capacity of the people. In the principal town of the canton, there are often solid buildings dating from pre-war days. The newer buildings are of wood. The small villages have houses of light materials with mixed wood and bamboo framing, bamboo floors and thatched roofing. The floors are raised above the ground from four to six feet. There are many areas of new settlement where new villages are springing up. The first houses to be built are mere huts typical of newly cleared areas.

(i) Habits of the people: The larger towns are similar to those in the other parts of Indochina. The shops are open as late as 10:00 p.m. so that many people are still outside, in the streets or around their houses. The rural people retire early for lack of light; they often stay in front of their houses in the evenings until they retire. Except under stress of insecurity, their habits are just like other rural people in Asia. The mountain tribes seem to have their own communal unity, again controlled by the factor of mutual help. Their houses are mostly close together.

2.2 The anti-malaria service

The anti-malaria service started its operations in October 1956 with its headquarters at the town of Savannakhet. Routine pre-operational surveys were carried out in Savannakhet and Khammouane provinces from October 1956 to March 1957. DDT residual spraying was started in May 1957. The technical adviser who has been present from the early days of the campaign is Dr. Prayoon Saibamroong, a distinguished Thai malariologist.

The programme is characterized by:

(a) Assuming that the epidemiology of malaria in Laos is similar to that of the neighbouring countries;

(b) Depending for its budget largely on outside aid;

(c) Operating under trying conditions of varying security in the field; and

(d) Building up a national malaria service with United States Operations Mission (USOM) assistance; many national personnel have been trained in Thailand; Thai technicians, employed by USOM, occupy the middle supervisory posts.

2.3 Entomological information

2.3.1 Anopheline species

The following species have been reported from Laos:

(1) Anopheles aconitus
(2) A. aitkeni bengalensis
(3) A. balabacensis
(4) A. barbirostris
(5) A. barbumbrosus
(6) A. insulaeflorum
(7) A. jeyporiensis candidiensis
(8) A. jeyporiensis jeyporiensis
(9) A. karwari
(10) A. kochi
(11) A. maculatus
(12) A. minimus
(13) A. nigerrimus
(14) A. palmatus
(15) A. philippinensis
(16) A. ramsayi
(17) A. sinensis
(18) A. splendidus
(19) A. subpictus
(20) A. tesselatus
(21) A. vagus

The common species are A. minimus, vagus, philippinensis, barbirostris and balabacensis.

2.3.2 Vectors of malaria

So far only A. minimus and A. balabacensis have been found with sporozoites, the former species being the main vector in most parts of the country. The results of mosquito dissections are as follows:

District	Date	minimus		balabacensis		Others	
		No. Dis.	No.gland positive	No. Dis.	No.gland positive	No. Dis.	No.gland positive
Savannakhet	Oct.1956-July 1957	772	10	-	-	783	0
Khammouane	" "	41	0	-	-	208	0
Tchèpone	Oct.1956-March1957	1,167	15	147	1	1,234	0
Phontiou	" "	541	9	1	0	581	0
Wang Kaen (40 km north Of Savannakhet	Sept1957-Nov.1957	-	-	133	4	-	-

2.3.3 Bionomics of vectors

Very little work has been done on this subject. The knowledge and experience regarding the bionomics of these two species gained in neighbouring countries have been applied to Laos. No insecticide-susceptibility tests of anopheline mosquitos have been carried out.

2.3.4 Epidemiology of malaria

Three species of plasmodial parasites (vivax, falciparum and malariae) are present. In the plains and the foothill areas, A. minimus is the main vector; in the forest areas, A. balacensis is an important vector. The transmission season in Laos has not been defined.

2.3.4.1 Pre-spraying surveys carried out:

Year	Provinces	Cantons	Villages	Population	Remarks
1956	2	88	303	58,725	
1957	3	117	291	94,085	including 2 prov. not surveyed before
1958	6	149	479	94,342	" 4 " " " "
1959	3	77	281	53,313	" 2 " " " "
Totals	14	431	1,354	300,465	

Of the twelve provinces in Laos, only ten were surveyed. The two not reached are the provinces of Phong Saly and Houaphanh, both bordering North Viet-Nam.

2.3.4.2 The surveys revealed the following ranges of percentages (Children 2 to 9 years):

Spleen rate ..... 37.0% to 75%
AES ..... 0.88 to 1.79
Parasite rate..... 27.0 to 68

In most areas the infant parasite rate was over 20%; in one it reached 71%.

2.3.5 Spraying operations

Extensive insecticide residual spraying with DDT at a dosage of 2 gm per square metre has been carried out once a year since 1957. The cycle of spraying is generally completed within two months between April and June before the heavy rains start. Between 1957 and 1959 the population protected by spraying has been increased from 180,787 to 951,564. At first, spraying operations were carried out mainly in the southern parts of the country. In 1959, In 1959, spraying was also started in northern Laos. The target for 1960 will not be reached due to security problems.

The spraying squad is composed of one foreman, three spraymen and two helpers serving as mixers. A spraying supervisor is in charge of three squads and is directly responsible to the chief of the zone office. Due to inaccessibility and insecurity the percentages of operations planned and those actually accomplished were as follows:

1957 - 96.3%
1958 - 59.2%
1959 - 79%

In the 1960 plans for spraying the areas were divided into:

(a) sprayable
(b) possibly sprayable
(c) cannot be sprayed

The percentages of the breakdown are the following:

(a) sprayable - 64%
(b) possible sprayable - 5.2%
(c) cannot be sprayed - 30.8%

(Note: It is peculiar to note that the population per house had varied as follows: 1957 - 5.15; 1958 - 5.45; 1959 - 5.78. In areas of countries with a population of over 150,000, it is unusual to find such a wide variation of the population per house. It suggests that these statistics require a critical evaluation).

2.3.6 Routine evaluation of spraying results

Morning collection of anophelines and random survey of larvae were carried out in areas where the spleen rate is above 40%; night collections with human bait were also undertaken.

Parasite surveys of infants and children (2-9 years old) were made; a spleen survey also was conducted. Generally, 20% of the total number of villages in a district and 20% of the total population of the above villages was surveyed. Morning collections of anopheline mosquitos were undertaken in 10-15 houses per village. Collection in each house was made for 20-30 minutes.

2.3.7 House-to-house visits

House-to-house visits have been undertaken in Savannakhet and Khammouane provinces where spraying has been in progress for three or more years. The interval of house visiting is one and one-half months. The houses are numbered and each house has a record card. Approximately 40 houses are canvassed per day. Blood smears are diagnosed at the zone office.

The first three visiting cycles occurred between October 1959 and March 1960. These visits are not carried out during the spraying campaign. In the first visit, a population of 121,430 was covered; in the second visit, 105,420; and the third, 88,397. Most of the districts covered in the house-to-house visits had case rates of over 1 per 1,000 population, even on the basis of these restricted surveillance operations.

2.4 Organization and personnel

Please refer to Annex I.

3. SUMMARY OF DISCUSSIONS

Discussions were held with the Government and the United States Operations Mission.

3.1 Present situation of malaria

During 1960, more than 900,000 population have been protected by house spraying. In general, it may be said that the operations have resulted in a very considerable reduction in the amount of malaria, but it appears that in many places spraying once a year has not succeeded in interrupting the transmission of malaria. This is shown in the following table, which gives results obtained from the same villages in each of three years.

Pre-operations survey	Pre-spray	Post-spray	
		1st	2nd
1. Number of A. minimus per 100 houses inspected	2.5	0.04	0.04
Number of A. minimus larvae per 100 dips	2.8	0.3	0.05
2. Children (2-9 years):			
Number examined for spleen rate	7,831	5,652	5,027
Spleen rate	78%	52%	33%
Number examined for parasites	6,679	5,449	4,861
Parasite rate	60%	28%	15%
3. Infants:			
Number examined for parasites	1,406	904	869
Parasite rate	53%	16%	12%

(Notes: The first and second sprayings were done in June-July 1957.
The first and second post spray surveys were done in August-January 1957-1958 and 1958-1959, respectively).

It is agreed by all parties that a considerable amount of investigation is still required before the project can be turned to one of country-wide eradication. There are some doubts as to the length of the transmission season, and it is not certain whether a secondary vector is involved. So far, the work has been carried out by the national malaria service, assisted by USOM in the form of advice and also supplies and equipment.

It is agreed that operations are hindered by inaccessibility of some areas, the lack of security and, to some extent, by lack of public co-operation in the village spraying.

3.2 Difficulties encountered in the present anti-malaria programme

(a) Communication: Communication is very difficult because of the great distance between the villages. The density of the population is about 28 persons per square mile but it is more realistic to reflect the development of the country by the size of the villages as measured by the number of houses per village. The situation in the province of Savannakhet is shown in Annex II. The breakdown of the concentration of houses in 424 villages in three districts and one sub-district are shown. It will be noted that the first 25% does not have more than 16 houses per village, the next 25% does not have more than 26 houses, and the third 25% does not have more than 37 houses per village. Ninety-six percent of all the villages do not have more than 75 houses. At five persons per house on the average, it is clear that the villages are very small with few resources. It has already been pointed out that they are usually situated at considerable distances from each other.

(b) DDT consumption: Almost 25% of the total amount of DDT is used for purposes other than antimalaria measures and mainly for agricultural purposes. Insecticide is given to the villagers by the spraying personnel in order to gain the necessary co-operation in spraying their houses.

(c) Supervision: A visit to the houses in the sprayed areas of Savannakhet confirmed that it had been very difficult to carry out a well-organized programme. In spite of the mark on houses to indicate that they have been sprayed in Muong Phine town and the village of Kha tribes in Tchepone (Sepone), it was difficult to tell which parts of the houses had actually been sprayed with DDT.

The lack of supervision during spraying operations has been underlined by the USOM consultant. Except the foremen who may have let the spraymen to the villages, no one at the upper echelon regularly visits the villages, except

those technicians serving as supervisors who are native of a village. These technicians have not had sufficient training to locate the villages on a map. As the names were formerly given the French sound equivalents and must now be identified by the local personnel, it is no easy matter to identify the present villages on old maps.

The local personnel for training as technicians are drawn from the highest scholastic background available which is five or six years. These recruits are given six months training in malariology in Thailand. Upon returning they serve in various capacities, such as spraying supervisors during the dry season, surveillance supervisors during the rainy season and do splenometry during surveys; some serve as microscopists and entomology technicians. It seems that a great deal is demanded from relatively untrained staff. The multifarious duties of these technicians throughout the year means that maintenance of equipment tends to be neglected; the spray cans and spare parts do not receive the necessary careful checking at the end of spraying operations.

3.3 WHO assistance

In considering the problems presented, note was taken of the progress of antimalaria operations in other countries where the epidemiological conditions appear to be similar. It appears that due to various technical and administrative problems, particularly that ot inaccessibility, it is not yet possible to consider converting the programme to a full-scale malaria eradication project. It was concluded therefore that the object of WHO assistance should be to assist in preparing the programme for a later full-scale eradication project. It is suggested that the following are the main lines on which the WHO assistance should be directed. It is considered that WHO advisers should work side by side with USOM advisers in providing technical assistance to the programme.

3.3.1 Classification of results

In considering the results that have been achieved it was noted that it had not been possible to correlate the results either with topography or the presence or absence of secondary vectors. Such classification had proved quite simple in Thailand and Cambodia and had been a great assistance in planning the

the later stage of the programme. It is suggested that a careful assessment of the results be made on a geographical basis, and that the results be classified according to the state of cultivation and the presence of jungle covered hills. In other countries in this area, it has been found that it is easy to achieve excellent results in the open cultivated plains but that the achievement of success in the jungle covered hills is much more difficult.

3.3.2 Epidemiological investigation

Some doubt was expressed as to whether the method of attack at present being used, that is spraying once a year of 2 grams technical DDT per square metre, was a correct one. This method had been found to be very successful in the cultivated plains in Thailand but had not achieved eradication in the hilly and mountainous areas. It was therefore suggested that an epidemiological investigation be set up with the object of discovering the length of the transmission period and also to identify any possible secondary vectors. Although much encomoligical work has already been done, it is considered that it is necessary to carry out observations on a continuous basis in order to provide a logical basis for the spraying cycle.

It is necessary to find out whether total coverage in insecticide spraying alone can interrupt transmission of malaria in Laos, both in the plains where A. minimus is probably the main vector and in the hilly areas where A. balabacensis may be important.

In addition to the parasitological survey, a more systematic and thorough investigation of the following entomological programmes should be undertaken in both the plains and hilly areas:

(a) Confirmation of vector species by dissection
(b) Mosquito density, indoor and outdoor
(c) Resting habits
(d) Man-biting rate
(e) Insecticide-susceptibility tests of both adults and larvae
(f) Survival rate observation
(g) Bioassay tests
(h) Any change of the vectors' behaviour

3.3.3 Operational changes

It was reported that there is reason to believe that some of the less satisfactory results were due to incomplete coverage. It is suggested that in the preparatory period it is necessary to discover whether the application of insecticide twice a year, in well supervised operations based on geographical reconnaissance, can succeed in interrupting transmission. It is suggested that a geographical reconnaissance be carried out as soon as possible and that during 1961 operations be carried out with particularly careful supervision in the area in which geographical reconnaissance has been performed.

It was agreed that it was necessary to determine:

(a) the frequency of spraying per year necessary to stop malaria transmission; and

(b) whether the conditions in the plains are different from the mountainous area in the matter of stopping malaria transmission.

Considering the various factors of geography, security and the overall information on malaria and the work on malaria carried out, it was agreed to choose the areas for a pilot study in the province of Savannakhet.

The WHO regional malaria sanitary engineer paid a visit at the district of Savannakhet to discuss possible areas for such trials. For the plain area, the district of Dong Hene is proposed and for the mountainous area, the district of Tchepone. In order to have about 3,000 houses with a population of about 15,000 in each of the regions (plain and mountainous), the breakdown of the number of villages into sizes of the villages based on the number of houses, is shown below:

Size of village (Number of houses) Range	Plain region Dong Hene district Number of villages	Mountainous region Tchepone district Number of villages
11 - 20	16	45
21 - 30	14	36
31 - 40	16	19
41 - 50	12	4
51 - 75	11	5
76 - 100	3	1
101 - 150	4	1
Total	76	111

(Note: The choice of these village sizes are based on the sizes of the villages in the districts concerned. Those with not more than 10 houses which also exist are not included as they are difficult of access. They will, of course, be included in the geographical reconnaissance.)

The division of each region into areas to be sprayed once a year and twice a year will have to be delineated during the period of reconnaissance, as the names of these villages are no guide to spot them on the map.

During the time of geographical reconnaissance, it is recommended that a sanitary engineer, skilled in map work, supervise the job closely, as most of these villages will be placed on the map for the first time. This work should take about 60 days.

To do the reconnaissance work on the above villages, the following personnel are necessary: one engineer from WHO to supervise, one national assistant at the supervisory level, four field foremen and sixteen data collectors, properly trained. The collection of data will involve 45 working days in the field. Summarizing and organizing the data by the engineer, the assistant and the four foremen will take about 10 working days.

3.3.4 Site and organization of WHO work

It seems favourable to carry out these operations in the area wherein a considerable amount of information is presently available in the provinces of Khammouane and Savannakhet. The WHO adviser should spend most of his time at Savannakhet and would, in close co-operation with the medical officer in charge of the malaria operations in Savannakhet, advise and help supervise the operations described above. In addition, the WHO adviser would have the responsability of impressing on the Government the importance of eventual transformation of the project into one of country-wide eradication when security and technical conditions are met. He would also work in close cooperation with the USOM adviser in giving technical advice on the programme. It is not recommended to extend the programme any further until country-wide eradication is feasible. While work is being carried out in Savannakhet to demonstrate that transmission can be interrupted, this area should serve as a good training ground to provide instruction to personnel against the time when it is possible to extend operations to cover the whole country.

3.4 Administrative matters

3.4.1 Personnel

The present personnel and their organization are shown in Annex I. It is not suggested that any major change is required at the moment.

3.4.2 Budget

The Government employs four physicians and twenty-three infirmiers as permanent staff. The rest of the staff and by far the greater part of the budget is provided by USOM. (See Annex III)

It is considered that this budget will be adequate for the proposed operations.

3.4.3 Training

Up to now 4 physicians and 107 technicians, on USOM fellowships, have been trained in antimalaria courses in Thailand. The course lasts for six months. Recently, also on USOM fellowships, one physician and one technician attended the Tala training course on malaria eradication.

4. SUMMARY AND RECOMMENDATIONS

It is concluded that although much progress has been made in reducing malaria in Laos, much remains to be done before a country-wide eradication programme is practicable.

With regard to the problems of security and accessibility, the solution of the problems does not lie in the hands of the malaria service.

The following operations, which will in any case be necessary before full scale eradication can be undertaken, and which have been described above, are required.

(a) A careful classification of the results obtained on a topographical basis.

(b) An epidemiological investigation to assess the transmission season and the presence of secondary vectors.

(c) A geographical reconnaissance followed by spraying operations in a limited area to assess how effective complete coverage will be in interrupting malaria transmission in Laos.

(d) Collection of the necessary information and preparation for the necessary organizational and administrative changes that will be required before an eradication plan can be prepared.

It is recommended that the following WHO assistance be provided to assist the Government in collaboration with the present USOM advisers. It is not suggested that WHO advisers should replace USOM advisers. It is recommended that operations continue in the areas that have already been sprayed but that no expansion be undertaken.

(1) A malariologist to be posted to Laos immediately with the object of assisting the Government and USOM to work out the details of the plan outlined above. He would then assist the Government with technical advice (in co-operation with USOM advisers) in carrying out the plan.

He would also be responsible for explaining the philosophy and requirements of a malaria eradication programme to senior government officers and others. He would also be responsible for assisting the Government in preparing for eradication.

He would be responsible for assessing the further needs for training of national staff.

He would need to spend part of his time in Savannakhet to assist in the supervision of operations and part of his time in Vientiane to carry out his other duties.

(2) Part-time entomological and engineering advice should be made available from the Regional Office and from the other WHO projects in Indochina; also a vehicle for the malariologist and a small amount for supplies, books and WHO publications.

(3) It is considered that the project is already well provided by USOM with the transport, supplies and equipment required.

It will be noted that in the above report no mention has been made of the "UN special areas". The question of these areas was discussed during the visit but it was decided that the philosophy of malaria eradication demands that the problem of the country as a whole be considered and that it would be unwise to dissipate the energy of the project in small areas where the effect produced would not be commensurate with the expenditure made. In any case there do not appear to be any resources available for anti-malaria work in the special areas, which are not being covered at the moment.

Acknowledgement

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Annex I

ORGANIZATION AND PERSONNEL

The malaria eradication project of Laos engages in four principal activities: The residual spraying of houses, routine evaluation of spray results, special investigations of factors relating to malaria transmission, and surveillance in those areas scheduled for discontinuation of spraying. The organization for these activities is as follows:

1. A Chief of the Malaria Eradication Project, Dr. Pheng Misaiphon, who is directly responsible to Dr. Kamlech Vilay, Acting Director General, Department of Health. The Chief is responsible for administering the project and through necessity must spend the greater proportion of his time on fiscal and other administrative matters.

2. An advisory staff, consisting of one USOM adviser, Dr. Maynard Johnson; one Thai contract physician-malariologist consultant, Dr. Prayoon Saibamroong; four contract Thai malaria technicians; and one USOM Thai mechanic. The Thai consultants, in addition to their advisory functions, serve to perform certain needed functions within the project. They assemble and interpret residual spray and epidemiological reports, train personnel, conduct special studies, maintain transport, and give the greater proportion of technical guidance to the programme. The USOM adviser works with the Thai consultants with respect to the technical aspects of operations and plays an important role in programming, release of allotments, and procurement.

3. A central malaria headquarters, consisting of a chief clerk, an accountant (position not occupied at this date), a storekeeper, a transportation officer (the Thai consultant), one draughtsman, and a central laboratory.

4. Four field headquarters - one each located in Vientiane, Savannakhet, Luang Prabang and Pakse. The field headquarters visited in Savannakhet was staffed by one infirmier as chief, a Thai malaria technician, one infirmier as assistant chief who also acted as property officer, one secretary-clerk, one mechanic, 6 drivers, and one boatman. The field force for operations consisted of 2 infirmiers, 16 technicians, 6 technical aids, 29 house visitors, and a sufficient number of spraymen and mixers to ensure house spraying.

5. Three sub-stations - two located in the Luang Prabang area at Nam Tha and Xieng Khouang and one located in the Vientiane area at Vang Vieng. These sub-stations are composed of personnel from field headquarters; usually an infirmier and an appropriate number of technicians, spraymen and mixers.

The Royal Government of Laos with support of its foreign advisers has recommended additional personnel for 1961 to conform with the following staffing pattern. In this connection, it has proposed four physicians with one for each of the field headquarters; 8 infirmiers with one for each of 8 sub-stations (the three mentioned as well as 5 more located in Saravane, Thakhek, Phonsaly, Attopeu, and Samneua), central office personnel consisting of an accountant, 4 typists, and 2 caretakers; and additional technicians for field operations. In detail, the personnel to be requested for 1961 are as follows:

Technicians	82
Technicians Aids	83
Secretaries	5
Typists	16
Orderly Officers (Messengers)	5
Caretakers	18
Mecanics	4
Drivers	35
Boatmen	9
Boatmen Aids	4
Draughtsmen	2
Storekeeper	1
Accountant	1
Projectionists	3
House visitors	70
Physicians	5
Infirmiers	24
Spraying personnel	1,500
	1,867

These requirements were planned on the basis of 1,400,000 population for spray protection and 160,000 population under surveillance. If recent security problems continue to persist, then the number of personnel will be reduced due to the fact that it will be impossible to protect all of the population planned for. The establishment of 6 additional sub-stations will also depend upon local security.

Many of the physicians and technicians assigned to the project have received their third country training. Three physicians and 87 technicians have received six months of training in Thailand. An additional physician and 20 more technicians will complete their training this summer.

A total of 29 employees (4 physicians and 25 infirmiers) have permanent ministry status. The rest are employed under the counterpart funds and therefore have job tenure only as long as counterpart funds exist. The project director has proposed a scheme to the Government wherein employees at the rate of 15 per year would be given ministry status. All employees with exception of some foremen and all spraymen are considered as salary employees. Temporary personnel (some foremen and all spraymen) are employed for approximately two months.

Annex II

SUMMARY OF DISTRIBUTION OF HOUSES IN VILLAGES IN SAVANNAKHET

(Frequency) Number of villages with house range

Group range No. of houses	Xepone district	Muong Phine district	Phalane sub-district	Dong Hene district	Total	Cumulative		% of group
						Total	%	
	(1)	(2)	(3)	(4)				
- 10	14	12	1	1	28	28	6.60	6.60
11 - 20	65	37	15	17	136	164	38.68	32.08
21 - 30	53	20	20	15	108	272	64.15	25.47
31 - 40	20	15	10	17	71	343	80.90	16.75
41 - 50	6	6	5	13	30	373	87.97	7.07
51 - 75	7	10	4	12	33	406	95.75	7.78
76 - 100	4	1	0	3	8	414	97.64	1.89
101 - 150	1	1	2	4	8	422	99.53	1.89
151 - 200	0	0	1	1	2	424	100.00	0.47
	181	102	58	83	424			

Note: Ninety-six percent of the villages have less than 75 houses.

ICA FINANCING OF THE LAOS MALARIA PROJECT

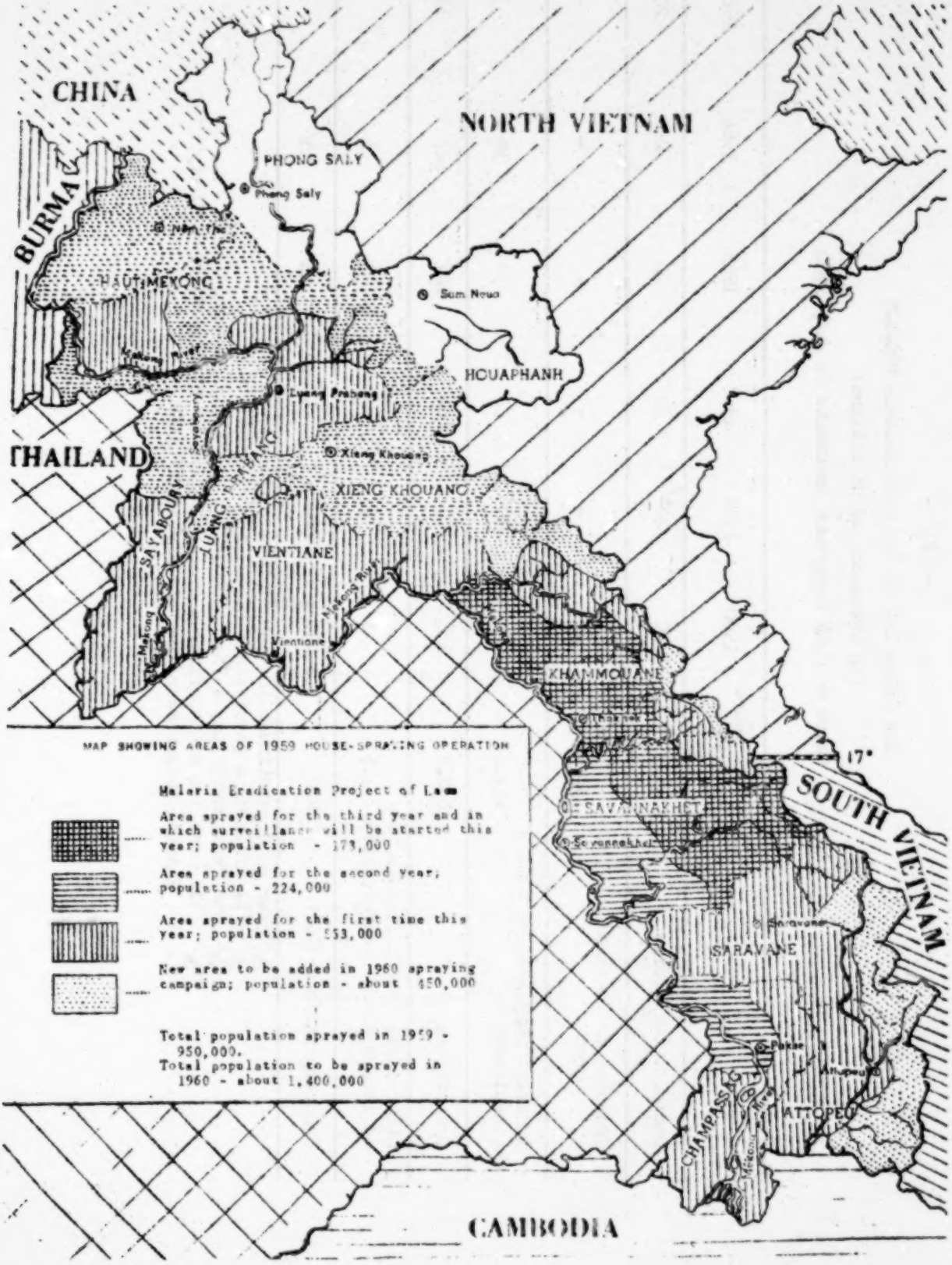
(In thousands of US dollars)

Based on USOM Programme Documents in July 1960

	All prior years 1955-1959	1960	1961	1962	1963	1964	1965
One U.S. technician	11.1	20	20 1/	20	20	20	20
Training in Thailand Cost	136.9 2/	-	-	-	-	-	-
Contract Services for Thai consultants	111.4	35	38 3/	38	38	38	38
Commodities	652.2	155	157	162	147	127	117
Other costs (Lao officials to international conferences)	2.5	3	3	3	3	3	3
Counterpart in dollars	802	425	750	4/	4/	4/	4/

1/ May be discontinued in view of U.N. participation
2/ 111 trained, 4 physicians and 107 technicians
3/ One Thai physician, 4 Thai technicians and 1 Thai mechanic
4/ Will continue but no figures available. As of FY 1959 $1.00 = 80 kip
Current budget approximately Kip 32.000.000

ANNEX IV



MAP SHOWING AREAS OF 1959 HOUSE-SPRAYING OPERATION

Malaria Eradication Project of Laos

Area sprayed for the third year and in which surveillance will be started this year; population - 173,000

Area sprayed for the second year; population - 224,000

Area sprayed for the first time this year; population - 553,000

New area to be added in 1960 spraying campaign; population - about 450,000

Total population sprayed in 1959 - 950,000.
Total population to be sprayed in 1960 - about 1,400,000

Distribution

WPRO - RD
DHS
PHAs
RAs
CAF
AFO(S)
AO(P)
BFO
OIO
PO
ASO
TRA
AUDITOR
LRO(6)
REGISTRY (2)
MEU (6)

AR, Saigon

FIELD STAFF

Dr. G. de Almeida	Dr. F.Y. Cheng	Dr. M. Miyairi
Mr. A. Natali	Mr. M. Pascal	Dr. W.H. Huehne
Mr. A. Th. Gouliouras	Dr. I.D. Carter	Mr. R. Slater
Dr. J.H. Pull	Dr. G. Kudicke	Prof. A.A. Sandosham
Dr. D. Moorhouse	Mr. P. Graham	Mr. W. B. Tanner
Mr. J.J. Jauregui	Dr. H.H. Chen	Dr. L. Cervone
Dr. F.C. Tsai	Mr. F. Lachance	
Mr. S. Guerrero	Mr. Alfredo Ocampo	
Dr. M. Sta. Maria	Mr. P. Martin	

HQ - REGISTRY (6)

GOVERNMENT - Monsieur le Ministre des Affaires étrangères du Gouvernement Royal du Laos, Vientiane

Monsieur le Ministre de la Santé publique, Vientiane

Directeur des Services médicaux

Directeur des Services antipaludiques

ICA - USOM/Laos
ICA/Philippines

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BUREAU REGIONAL DU PACIFIQUE OCCIDENTAL

P.O. Box 2932 Manila

DC Mal 7 (Advisers' Reports)
Laos 5

WPR/MAL/FR/46 Corr.1
10 January 1961

ORIGINAL : ENGLISH

REPORT ON FIELD VISITS TO LAOS

CORRIGENDA

Page 4, 2.3.2 Vectors of malaria

In the last main column ("Others") the figures under the sub-column ("No. Dis.") should be amended as follows:

"783"	to be replaced by			"11"
"208"	"	"	"	"167"
"1 234"	"	"	"	"10"
"581"	"	"	"	"39"

Page 5, 2.3.4.1 Pre-spraying surveys carried out

The figures presented in the Table under "Provinces" cannot be totalled because some Provinces are partly surveyed and appear twice in the Table. Laos has only 12 Provinces.

Under "Remarks" in line with 1956 please add: "2 provinces not surveyed before". On a line with "Totals" add "10 provinces not surveyed before".

Page 7, 3.1 Present situation of malaria

Para.1 Amend "During 1960" to read "During 1959".

Table, item 1 Amend figure in second column ("Pre-spray") from "2.5" to read "25". Amend figure in last column ("2nd Post-spray") from "0.04" to read "0".

Table, item 2, Spleen rate Under second column amend "78%" to read "72%".

"Notes:" In the first note following "June-July" add "and 1958".

Page 15, Annex I, sub-para, 1, line 2

Amend "Dr. Kamlech Vilay" to read "Dr. Khamleck Vilay".

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DC Mal 7 (Advisers'Reports)
Cambodia 1-E
WPRO 68-E

WPR/MAL/FR/66
1 June 1961

ORIGINAL : ENGLISH

REPORT ON A FIELD VISIT TO CAMBODIA

30 March - 6 April 1961

by

M. Postiglione*

Contents

		Page
1.	Purpose of visit	1
2.	Summary of the report	1
3.	Brief review of the malaria programme (Cambodia-1)	1-3
4.	Brief review of the medicated salt project (WPRO 68)	4
5.	Conclusions and recommendations	4
	Acknowledgement	5
	Annex 1 - Officials contacted	6
	Annex 2 - Meetings attended	7
	Annex 3 - Sketch Map of Cambodia	8
	Distribution	9

* Senior Regional Malaria Adviser, WHO, WPRO
WPR/321/61.

1. PURPOSE OF VISIT

(a) To review and assess the present status of the Cambodia malaria project and advise on its future development.

(b) To review and assess the medicated salt project (Pailin area, north-west Cambodia.

2. SUMMARY OF THE REPORT

The writer visited Cambodia from 30 March to 6 April 1961 to discuss with the Government, USOM and WHO officials the present position of the malaria programme.

In view of the lack of facilities and of professional and auxiliary staff, field operations could not be carried out thoroughly.

If support is obtained it is considered advisable that a reorganization of the service be effected step by step and operations be decentralized in some areas initially. It is suggested that a "pre-eradication programme" be initiated in 1962. This is advisable in view of the lack of suitably qualified national candidates and of the fact that rural public-health services are being developed at present. The writer also reviewed the medicated salt research project (Pailin area, north-west Cambodia). Pyrimethamine in salt has not produced any significant reduction in malaria rates and a new approach may needed.

3. BRIEF REVIEW OF THE MALARIA PROGRAMME (CAMBODIA-1)

For background, please refer to documents WPR/MAL/FR/6, 14 and 45.

The last exchange of letters expired in March 1961. A new exchange of letters is under negotiation to cover WHO assistance until the end of this year. The Government is expected to prepare, with WHO assistance, a comprehensive plan of operations to cover subsoquent years.

The present national staff, and particularly its chief, are to be praised for the achievements obtained so far by this project. It is the considered opinion of the writer that had it been possible to provide them with additional facilities they would have been able to accomplish a more complete task. It should be added that they are fully aware of the present shortcomings. The

/opinions expressed

opinions expressed in this report should be taken not as a criticism but as an objective review in order to formulate constructive and realistic suggestions so that the project may be geared to work satisfactorily towards the accomplishment of malaria eradication from Cambodia.

The total population of the country is about 5 million; the population in the malarious areas is said to be one million.

Spraying activities have been carried out in some areas. The level of endemicity has been reduced considerably in certain zones. However, there are indications that malaria transmission may not have been stopped everywhere. Some areas have not been surveyed yet. Facilities for the examination of blood slides for parasites need improvement both from the point of view of equipment and supplies, as well as of staff, in number and quality.

A. minimus and A. balabacensis are the confirmed vectors. The density of A. minimus has been greatly reduced after spraying. A.balabacensis still can be found in certain numbers resting outdoors and has been found naturally infected with sporozoites in newly sprayed areas. Susceptibility tests have not shown any signs of resistance. It is possible that spraying may not have been thorough or that mosquitos may not have picked up lethal doses of insecticide before escaping from sprayed houses. A suspected vector is A. maculatus.

Geographical reconnaissance needs to be completed. Spraying operations carried out so far have not attained total coverage everywhere and there is room for improvement of supervision. There is need for reorganizing the whole service both at the central and peripheral level. If the necessary backing is obtained, facilities in the central headquarters could be improved and a suitable number of peripheral units could be established. For this, once adequate employment conditions to attract and retain suitable professional and auxiliary people have been established, it is necessary to recruit, train and post an adequate number of personnel. Some difficulty is experienced in the provision and distribution of equipment, supplies and in transport.

Health education activities could be improved. There is need to organize and develop training facilities for national staff.

/The project is

The project is also supported by USOM.

The most important problems at present are lack of adequate support and the absence of professional and auxiliary staff in headquarters and the field. Once adequate administrative facilities are provided and the necessary staff are employed, it would be possible to build up slowly an efficient malaria service.

Professional people are actually lacking in the country and it may take some time before a sufficient supply is built up. The public health services are developing at present and it is hoped that in due course they will be able to provide the support requested by a malaria eradication programme.

A study of the epidemiological, geographical and other aspects of the malaria problem will have to be completed. A special organizational effort will be required to reach certain areas where accessibility is not easy at all seasons. Experience has proved that in areas where A. balabacensis is the vector special studies may have to be carried out to devise the best means to interrupt transmission. Such studies have been outlined in the regional entomologist's report (document WPR/MAL/FR/62). It is suggested that these may be undertaken when the national service has an adequate organization and sufficient physical and personnel facilities.

The WHO staff assigned to the country is composed of one malariologist, one entomologist and one technician. If the programme is given the necessary support it may be advisable to provide an engineer from WHO in order to help in the planning, organizing, and training required to put the service on an effective basis. Secretarial and clerical facilities are lacking and the WHO technical staff use a great part of their time to fulfil this task.

Special acknowledgement should be made of the enthusiasm and devotion of the national staff of this project. Notwithstanding the lack of operational facilities it has done its best to obtain as much as possible, in spite of the difficulties facing this programme.

/4. BRIEF REVIEW

4. BRIEF REVIEW OF THE MEDICATED SALT PROJECT (WPRO-68)

For background information please refer to documents WPR/MAL/FR/47 and 55.

The plan of operation expires in June 1961. A new plan of operations will be required for the reorganization of the project. The area covers the population of about 20,000. The objective of the project is the interruption of transmission leading to eradication of malaria through the depletion of the malaria parasite reservoir by means of medicated salt. This is therefore a research project since it aims at interruption of transmission by a method, the efficacy of which has not been well defined yet. Distribution started in 1960 using pyrimethamine in the common salt. Surveys carried out in 1959 before distribution of salt and after 1960, proved that no significant reduction was achieved in the level of endemicity. The reasons might have been that the drug intake was not adequate, that the population was obtaining salt from other sources, that probably pyrimethamine resistance had been developed, etc. At the time of writing this report WHO Headquarters has decided to reorganize the project using chloroquine instead of pyrimethamine suggesting the reduction of the area to cover a population of about 8.000 and assigning other WHO staff to take responsibility of the project. So far, only one WHO technici n has been in charge of field activities under the supervision of the malariologist of Cambodia-1. The facilities for this project could be improved particularly as regards provision for the examination of blood slides. A factor hampring the successful distribution of salt is the inaccessibility of some villages during the rainy season and the frequent influx of outside population in the experimental area.

Co-operation from other sources (private firms and the Pasteur Institute) has been obtained in the actual production of the "premix" and the subsequent mixing of the latter with common salt.

5. CONCLUSIONS AND RECOMMANDATIONS

A redefinition of the malaria project is in progress. A comprehensive plan of operations is required before the end of 1961. It is recommended that

/operations be

operations be particularly improved in certain areas of importance from the industrial, commercial and touristic viewpoint. The aim of these operations should be total coverage and interruption of transmission. Good results could be achieved by a small organization well staffed, equipped and run. Later it may be possible to develop the necessary facilities to extend these activities to other areas in order to prepare the programme step by step for the operations that would lead in future to eradication.

In view of the fact that there is an actual lack of people to occupy professional posts and since improvement is needed in the administrative and physical facilities to support an eradication programme it is suggested that it would be indicated to establish in 1962 a pre-eradication programme. When experience has shown that the service can actually carry out satisfactorily operations from all points of view it would be possible to plan for eradication. Then it would not be necessary to go through a pre-eradication survey, a preparatory phase and the required number of years foreseen for the attack phase. It is advised not to plan at this stage for eradication unless experience shows that satisfactory operations can actually be carried out by the national service.

Acknowledgement

The writer wishes to acknowledge with thanks the co-operation received during the visit from the national staff, USOM and WHO colleagues.

/Annex 1

Annex 1

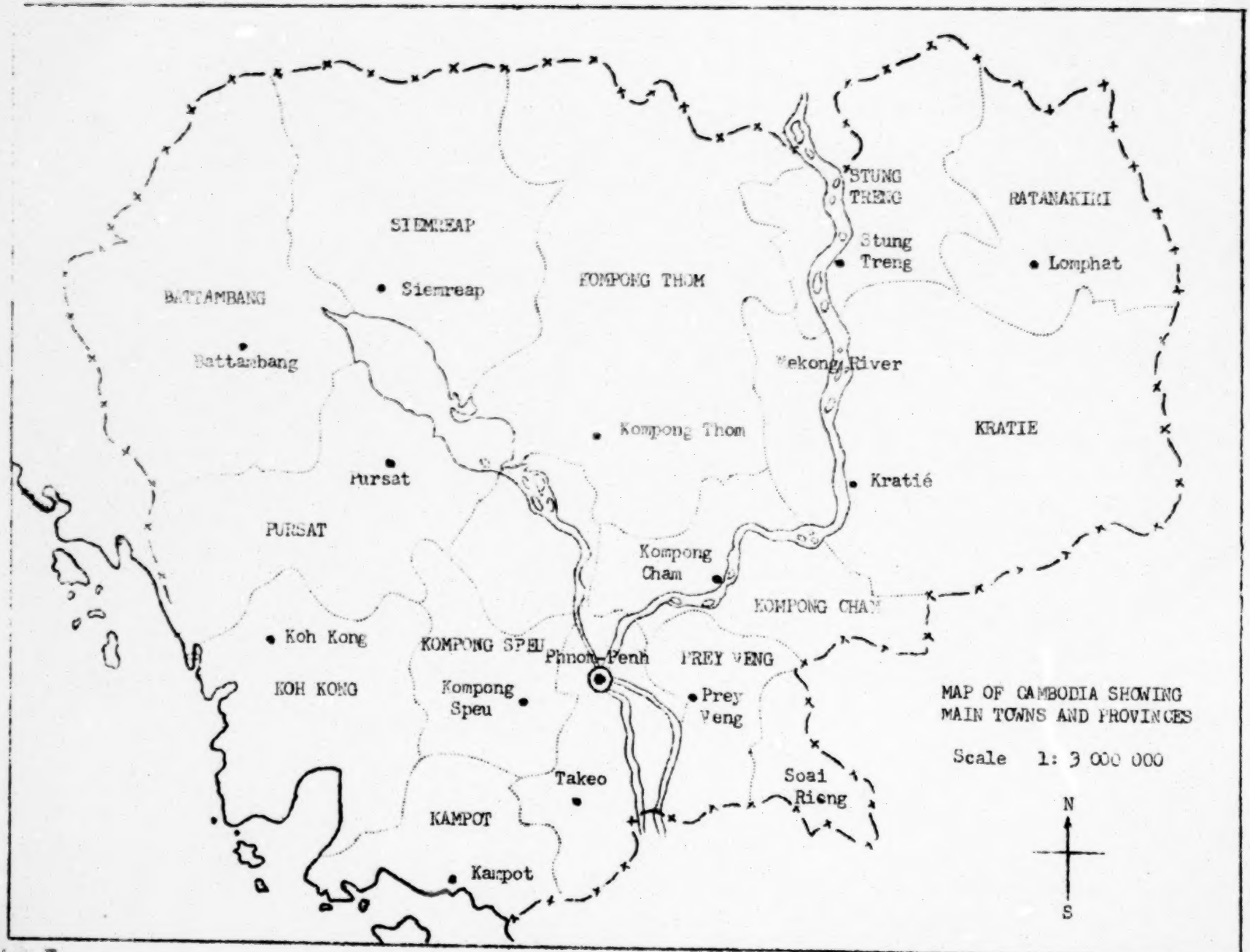
Officials Contacted

Government :	His Excellency, the Minister of Health, Mr. Ung Hong Sath
	The Chief of the Cabinet, Dr. Ber Keng Hean
	The Director of Health Services, Dr. Thor Penh Tong
	The Chief of the Malaria Service, Dr. Keo Thann
USOM :	The Deputy Director, Mr. S. Baron
	The Chief of the Public Health Service, Dr. J. Kennedy
TAB:	The Regional Representative of the Technical Assistance Board, Mr. W. de Selys Longchamps
WHO:	Dr. J. Bierdrager, Country Liaison Officer
	Dr. G. de Almeida, Senior Adviser and Malariologist
	Mr. F. Lachance, Entomologist
	Mr. A. Natali, Technician (Spray operations)
	Mr. R. Slater, Technician (WPRO 68)

Annex 2

Meetings Attended

30 March 1961	3.30 p.m.	Discussions with the team members of Cambodia-1. Technical review of various operations. Assessment of results achieved. WHO participation.
31 March 1961	9.30 a.m.	Meeting with Dr. Keo Phann and team members of Cambodia-1. Review of present situation. National Malaria Service: present facilities and additional requirements.
	4.30 p.m.	Meeting with Dr. J. Kennedy, USOM and Dr. G. de Almeida. Review of present situation. USOM and WHO participation.
1-2 April 1961	morning & afternoon	Discussions with WHO team members on Cambodia-1.
3 April 1961	morning & afternoon	Discussions with WHO team members on WPRO-68
4 April 1961	9.00 a.m.	Meeting at the Ministry of Health between the Government, USOM and WHO. General review of the projects. Prospects for the future.
5 April 1961	9.30 a.m.	Meeting at the National Malaria Service level with Dr. Keo Phann and WHO personnel. Detailed discussions on technical and operational aspects and on possible future development of the Cambodia-1 and WPRO-68 projects.



MAP OF CAMBODIA SHOWING MAIN TOWNS AND PROVINCES

Scale 1: 3 000 000

DISTRIBUTION

GOVERNMENT : Monsieur le Secrétaire d'Etat
à la Santé publique du Royaume du Cambodge
Phnom-Penh
Cambodge

Monsieur le Ministre des Affaires étrangères
du Royaume du Cambodge
Direction des Conférences
Phnom-Penh
Cambodge

Dr. Keo Phann (3)
Chef du Service antipaludique
Ministère de la Santé
Phnom-Penh
Cambodge

AR's Office : Représentant de zone de l'OMS, Saigon

RTAR : Mr. Walter de Selys Longchamps

Field Staff (22)

Dr. J. Bierdrager

USOM : USOM/Cambodia

The Regional Malaria Adviser, ICA/Philippines

HQ : REGISTRY (6)

WPRO : RD
DHS
ADHS
PHA
RAs
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LRO (6)
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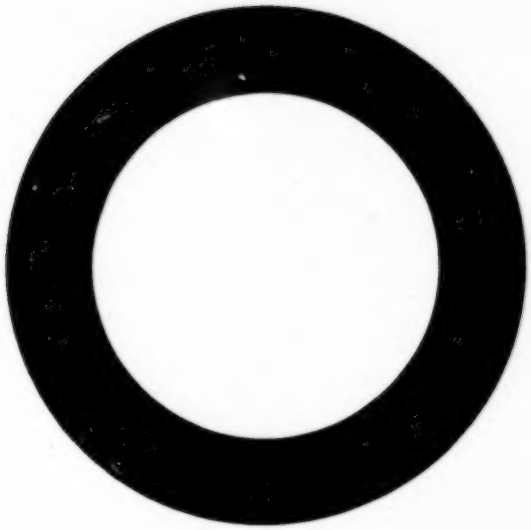
MEU (6)



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DC Mal 7 (Advisers' Reports)
Viet-Nam 16-E
WPRO 39-E

WPR/MAL/FR/65
30 May 1961

ORIGINAL : ENGLISH

REPORT ON A FIELD VISIT TO VIET-NAM 25-30 March and 6-7 April 1961

by

M. Postiglione [V]

C O N T E N T S

		Page
1.	PURPOSE OF VISIT	2
2.	SUMMARY OF REPORT	2
3.	BRIEF ASSESSMENT OF THE MALARIA ERADICATION PROGRAMME IN VIET-NAM (Background and evaluation)	2
4.	ANTI-MALARIA CO-ORDINATION BOARD (WPRO-39)	4
5.	CONCLUSIONS AND RECOMMENDATIONS	4
6.	ACKNOWLEDGEMENTS	4
	ANNEX I DIARY OF VISIT	5
	ANNEX II OFFICIALS CONTACTED	6
	ANNEX III MEETINGS ATTENDED	7 - 8
	ANNEX IV SKETCH MAP OF VIET-NAM	9
	ANNEX V LIST OF REPORTS ON RECENT FIELD VISITS TO VIET-NAM	10
	DISTRIBUTION	11

[V] Senior Regional Malaria Adviser, WHO, WPRO

1. PURPOSE OF VISIT

1. To review the present development of the malaria eradication programme in Viet-Nam.

2. To review the activities of the Anti-malaria Co-ordination Board (AMCB).

2. SUMMARY OF REPORT

The opinions expressed in this report should not be taken as a criticism but as an objective review in order to formulate constructive and realistic suggestions so that the project may be geared to work satisfactorily towards the accomplishment of malaria eradication in Viet-Nam.

The writer, during his visit to Viet-Nam, reviewed the present malaria programme with national, United States Operations Mission (USOM) and World Health Organization (WHO) advisers.

It is suggested that the programme concentrate its activities in accessible areas and improve its performance in order to obtain better results. For this, a better organization of the service, recruitment of additional professional and auxiliary staff, improvement of technical standards as well as other improvements may be required.

Meanwhile, WHO assistance in terms of country advisers could be adjusted in order to suit the needs of the present programme.

The writer also reviewed the present position regarding arrangements for the work of the AMCB.

3. BRIEF ASSESSMENT OF THE MALARIA ERADICATION PROGRAMME IN VIET-NAM (Background and evaluation)

For background, refer to the documents WPR/MAL/FR/44 of 26 September 1960 and WPR/MAL/FR/56 of 28 December 1960.

The activities carried out by the national malaria eradication service during the last three years have brought about a sizeable reduction in the endemicity of malaria. The accomplishments achieved so far are the result of the enthusiastic effort displayed by the present national staff with the whole-hearted support of USOM. These achievements are much more valuable if viewed in the light of the difficulties through which the programme has gone.

The present national staff, and particularly its chief, are to be praised for the achievements obtained so far by this project. It is the considered opinion of the writer that had circumstances been more favourable, they would have been able to accomplish a more complete work. It should be added that they are fully aware of the present shortcomings.

The last exchange of letters with the Government expired at the end of 1960. A new exchange of letters is under negotiation to cover WHO assistance until the end of 1961. A plan of operations for malaria eradication was prepared by the Government in 1960. WHO Headquarters found that it did not comply with the standards set in the WHO document "Minimum provisions of an acceptable plan for eradication of malaria".

The total malarious population is about 12 million. Of this, about 6 million are reported to be covered by antimalaria measures.

Blood surveys are carried out in accessible areas. There are indications that in the present conditions spray operations may not lead to the interruption of transmission and to eradication of the disease.

The proved vectors are Anopheles minimus, A. jeyporiensis jeyporiensis and A. jeyporiensis candidiensis. Other suspected vectors are A. sundaicus, A. subpictus as well as the "A. hyrcanus" group and "A. leucosphyrus" group.

No insecticide resistance has been reported so far. Routine entomological investigations are carried out in the study centres of Dilinh and Gocong.

Spraying operations are carried out in accessible areas, twice a year, using DDT at the dosage of 2 gm per square metre.

In order to effect complete geographical reconnaissance and thorough spraying, the peripheral organization requires additional trained staff and adequate supervision.

Additional staff of the professional level employed full-time are needed to fill key positions in central and peripheral headquarters. Adequate employment conditions have to be provided to attract and retain suitable personnel in the malaria service. Clear lines of responsibility need to be improved throughout the service. The need is felt for the establishment of channels to allow for the regular flow of instructions from central headquarters to field units. Similarly, there is room for improving the reporting system from the periphery to the centre.

Training of national staff is good in the field of entomology and could be improved in other operational activities.

Such aspects as finance, equipment and supplies, as well as transport are adequate. Improvements might be brought to the system ensuring that the materials (equipment and supplies) necessary for field operations are sent to the field when they are required.

Insecurity is a problem. Other immediate and fundamental requirements are: stronger support, an adequate number of professional staff, improvement in the whole organization, effective supervision of field operations and improvement of technical standards in the various activities of the service.

WHO advisers assigned to the project are one malariologist-senior adviser, one zone malariologist, one sanitary engineer, one entomologist, and one technical assistant (laboratory). There is a scarcity of national counterparts and it is not always possible to implement the advice provided by WHO Staff. A study is being made at present to establish the type of assistance the programme needs from WHO in the circumstances.

4. ANTI-MALARIA CO-ORDINATION BOARD (WPRO-39)

The opportunity was taken to review the present situation as regards the activities of the secretary of the Board (Dr. W.H. Huehne).

The fourth Anti-malaria Co-ordination Board meeting was held in December 1959 at Kuala Lumpur. The fifth one was first to have been held in Laos in December 1960, then negotiations proceeded for it to be held in Cambodia in February 1961, but it had to be postponed. It is now probable that the next meeting might be held in Phnom Penh in November 1961, subject to government agreement.

Dr. Huehne is proceeding on home leave, after a study tour, and is subsequently expected to return to his duty station and make arrangements for the next Board meeting. During this meeting, the question of its secretary will be discussed. It is debatable whether WHO can afford an experienced malariologist to fulfil the functions of the Board secretary which can now be carried out by country advisers or by inter-country teams with the help of the Regional Office staff. It is beyond doubt that the results obtained by the Board have been extremely useful and the Board as such should continue its work.

5. CONCLUSIONS AND RECOMMENDATIONS

It is recommended that the exchange of letters now under negotiation be completed in order to assure the assistance of the Organization until 1961. Meanwhile the WHO senior adviser will appraise the present situation and suggest the best possible way of assisting the programme in future years. He will also be able to assist the Government in preparing the plan of Operations required after the expiry of the exchange of letters under negotiation. It is foreseen that WHO can help in the training of staff in this programme. It is suggested that having obtained adequate support, it will be necessary to create attractive employment conditions in order to secure the necessary professional and auxiliary staff. After selection, they should be trained and posted both in headquarters and at peripheral level.

It is recommended that activities be concentrated in accessible areas where it is possible to establish an efficient organization to carry out operations on a total coverage basis, in order to obtain interruption of transmission and eradication of the disease. Meanwhile, the service would prepare itself to carry out the same work in other areas as they become accessible.

6. ACKNOWLEDGEMENTS

Acknowledgement should be made of the efforts carried out so far by the Administrator-General of the programme and of the devotion and spirit of sacrifice of the staff at present employed in the programme. The whole-hearted support of USOM must also be recognized. Thanks to the effort of the national staff, with the support of USOM, the progress made so far by this campaign has been possible in a period of about three years. The results obtained so far have been able to reduce the level of endemicity in the protected areas.

The writer is greatly indebted to General Tran Tu Oai, Administrator-General of the programme, to the USOM staff and to the national colleagues as well as to the WHO country advisers for the help they extended to him during his visit.

ANNEX I

DIARY OF VISIT

25 March 1961 - Arrived at Saigon from Manila.

26 March " - Review and discussions on Viet-Nam malaria project with WHO staff:

Spraying operations
Laboratories

27 March " - Discussions with WHO senior adviser to the project.

- Meeting with General Tran Tu Oai, Administrator-General, Administration General for Malaria Eradication.

28 March " - Review and discussions on Viet-Nam malaria project:

Role of zone malariologist
Entomology activities
Epidemiology activities
General and administrative matters

29 March " - Discussions on exchange of letters.

- Meeting with USOM personnel.
- Meeting with Dr. Tran-Vy, Minister of Health, Viet-Nam.
- Talks with General Tran Tu Oai.

30 March " - Left Saigon for Phnom Penh, Cambodia.

6 April " - Returned to Saigon from Phnom Penh.

- Discussions on Viet-Nam malaria project with WHO staff.

7 April " - Left Saigon for Manila.

ANNEX II

OFFICIALS CONTACTED

1. GOVERNMENT : Dr. Tran-Vy, Minister of Health
General Tran Tu Oai, Administrator-General, Administration General for Malaria Eradication (AGME)
Dr. Nguyen Tuong, Technical Deputy, AGME
Dr. Nguyen-van-Thieu, Chief, Epidemiology Service, AGME
Dr. Le-Du, Chief, Operation Service, AGME

2. USOM : Dr. W. Boynton, Chief, Public Health Division, USOM
Mr. J. Taylor, Chief, Malaria Unit, USOM
Dr. G. Stein, Epidemiologist, Malaria Unit, USOM
Mr. J. Hester, Administrator, Malaria Unit, USOM

3. WHO : Dr. A.E. Brown, Area Representative, Saigon
Dr. W.H. Huehne, Secretary, Anti-malaria Co-ordination Board
Dr. H.H. Chen, WHO senior adviser and malariologist
Mr. A.C. Ocampo, Sanitary engineer
Dr. L. Cervone, Entomologist
Mr. P. Martin, Technical assistant (laboratory)
Dr. M. Miyairi, Zone malariologist, Nha-Trang (Zones III-IV)

ANNEX III

MEETINGS ATTENDED

1. Date: Sunday, 26 March 1961, 3:00-5:30 p.m.
Place: WHO Area Representative's Office, Saigon
Persons attending: WHO - Dr. M. Postiglione
Dr. W.H. Huehne
Dr. H.H. Chen
Mr. A.C. Ocampo
Dr. L. Cervone
Mr. P. Martin
Dr. M. Miyairi

S Subject: Review and discussions on Viet-Nam 16 malaria projects on spraying operations and laboratory.

2. Date: Monday, 27 March 1961, 4:15-4:30 p.m.
Place: Administrator-General's Office, AGME, Phu-Tho, Saigon
Persons attending: WHO - Dr. M. Postiglione
Dr. A.E. Brown
Dr. H.H. Chen

AGME - General Tran Tu Oai

Subject: Courtesy visit and general discussion on the development of the Viet-Nam malaria eradication programme.

3. Date: Tuesday, 28 March 1961, 10:20 a.m.-1:30 p.m. and 3:00-5:30 p.m.
Place: Continental Hotel, Saigon
Persons attending: WHO - Dr. M. Postiglione
Dr. H.H. Chen
Dr. L. Cervone
Dr. M. Miyairi

Subject: Review and discussions on Viet-Nam malaria project on zone malariologist activities, entomological activities, administration and general matters.

4. Date: Wednesday, 29 March 1961, 10:20 a.m. - 12:20 p.m.
Place: USOM Public Health Office, Saigon
Persons attending: WHO - Dr. A.E. Brown
Dr. M. Postiglione
Dr. H.H. Chen

USOM - Dr. W. Boynton
Mr. J. Taylor
Dr. G. Stein

Subject: Review of Viet-Nam malaria programme.

ANNEX III

Summary

The writer referred to the review of WHO-assisted malaria programmes in the Western Pacific Region done in March 1961 in connection with the visit to Manila of Dr. C.A. Alvarado, Director, Division of Malaria Eradication, WHO Headquarters. The Viet-Nam malaria programme had been discussed with Dr. I.C. Fang, Regional Director, WPRO, and the decision had been reached that the WHO assistance should be reviewed. The present organization, number and type of professional and auxiliary staff, the standard of certain technical methods, the lack of total coverage in field operations and the present insecurity were not conducive to the eradication of malaria. WHO would review the needs of the programme and assess the most effective type of assistance the latter could absorb, pending the preparation of a plan of operations with objectives which could be within reach of the programme. This assessment could be carried out by the WHO senior adviser assigned to the project. It was clearly stated that WHO's intention was not to withdraw its assistance but to find the most rational and realistic way of helping the programme, particularly in view of WHO financial limitations. The consistent and generous USOM support was recognized. The USOM officials expressed concern at the possibility of the withdrawal of WHO staff and hoped that WHO assistance would continue.

5. Date: Wednesday, 29 March 1961, 4:40-5:30 p.m.
Place: Office of the Minister of Health, Saigon
Persons attending: WHO - Dr. A.E. Brown
Dr. M. Postiglione
Dr. H.H. Chen

Government - Dr. Tran-Vy

Subject: WHO assistance to Viet-Nam malaria programme.

6. Date: Thursday, 6 April 1961, 4:30-5:00
Place: Phu-Tho Headquarters, AGME
Persons attending: WHO - Dr. M. Postiglione
Dr. H.H. Chen

Government - Dr. Nguyen Tuong, AGME

Summary: Review of programme problems, present national and WHO positions and prospect for future.

ANNEXE IV

REPUBLIC OF VIET-NAM
SKETCH MAP SHEWING DIVISION
OF COUNTRY IN ZONES
17°
17°
15°
15°
N
W
S
I
II
III
IV
V
VI
VII
VIII
Quang-Tri
Hue
Tourane
Faifo
Quang-Ngai
Kontum
Pleiku
Qui-Nhon
Song-Cau
Ban Me Thuot
Nha-Trang
Dalat
Loc-Ninh
Phan-Rang
Tay-Ninh
Thu Dau Mot
Bien Hoa
Gia Dinh
SAIGON
Phan-Thiet
Chau Doc
Long-Xuyen
Cap St. Jacques
Ha-Tien
Sadec
Can-Tho
Vinh Binh
Rach-Gia
Soc-Trang
Ca-Mau
Bac-Lieu
Poulo Condore
MER DE CHINE
SCALE
1 : 2 000 000

ANNEX V

LIST OF REPORTS ON RECENT VISITS TO VIET-NAM

1. Dr. M.J. Colbourne: Rapport sur une Visite au Viet-Nam, 3-4 and 14-16 November 1958 WPR/MAL/FR/7, 20 November 1958

2. Dr. M.J. Colbourne: Report on a Field Visit to Viet-Nam, 23-25 February 1959 WPR/MAL/FR/10, 16 March 1959

3. Professor C.Y. Chow: Report on a Field Visit to Viet-Nam (Entomological Aspects) 23-28 March 1959 WPR/MAL/FR/15, 13 July 1959

4. Dr. H.A. Coll: Report on a Visit to Viet-Nam, 4-9 May 1959 MHO/PA/142.59, June 1959

5. Dr. H. Shiga: Report on a Field Visit to Viet-Nam, 11-16 May 1959 WPR/ET/FR/5, 8 June 1959

6. Dr. M.J. Colbourne: Report on Field Visits to Viet-Nam, 25-29 March and 18-21 September 1959 WPR/MAL/FR/26, 30 September 1959

7. Professor C.Y. Chow: Report on a Field Visit to Viet-Nam (Entomological Aspects), 22 October-2 November 1959 WPR/MAL/FR/29, 14 December 1959

8. Professor C.Y. Chow: Report on a Field Visit to Viet-Nam (Entomological Aspects), 5-22 May 1960 WPR/MAL/FR/41, 13 June 1960

9. Dr. M.J. Colbourne: Report on a Field Visit to Viet-Nam, 14-18 July and 7-10 August 1960 WPR/MAL/FR/44, 26 September 1960

10. Dr. M.J. Colbourne: Report on a Field Visit to Viet-Nam, 26-30 November 1960 WPR/MAL/FR/56, 28 December 1960

11. Professor C.Y. CHow: Report on a Field Visit to Viet-Nam (Entomological Aspects), 22-25 February 1961 WPR/MAL/FR/61, 3 April 1961.

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Représentant de zone de l'OMS, Saigon

General Tran Tu Oai

WHO: RD
DHS
ADHS
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CAF
AFO (S)
AO(P)
BFO
PIO
PO
ASO
TRANS
AUDITOR
LR (6)
REGISTRY (2)
MEU (6)

Field Staff (22)

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USOM/Saigon

The Regional Malaria Adviser
ICA/Philippines
Dewey Boulevard
Manila

WORLD HEALTH ORGANIZATION

ORGANISATION MONDIALE DE LA SANTE

November 1960

NEW NOMENCLATURE FOR COUNTRY MALARIA ERADICATION PROJECTS

The absence of a clear nomenclature and appropriate terms of reference for the different types of malaria eradication country projects had created much confusion which was reflected as much in the planning stage of the projects as in the budgetary provisions. These circumstances made it necessary to review the existing denominations and to give clear names and unequivocal terms of reference to the specific types of projects to which the Organization can give its support. The categories of such projects have been simplified and fall under six headings:

(a) Malaria eradication programmes (MEP)
(b) Pre-eradication survey projects (PES)
(c) Malaria eradication pilot projects (MEPP)
(d) Pre-eradication programmes (PEP)
(e) Malaria eradication training projects (METP)
(f) Malaria eradication field research projects (MEFRP)

These categories can be briefly described as follows:

(a) A malaria eradication programme is an operation aimed at the ending of the transmission of malaria and the elimination of the reservoir of infective cases, in a campaign limited in time and carried to such a degree of perfection that, when it comes to an end, there is no resumption of transmission. The programme may be carried out either simultaneously throughout a whole malarious area or by stages. It comprises four phases - preparatory, attack, consolidation and maintenance, (as defined in the Sixth Report of the Expert Committee on Malaria). In cases in which the eradication has already reached advanced stages (as in some European countries) the project can be considered a malaria eradication programme and assisted as such provided it is adjusted to the corresponding phase.

(b) A pre-eradication survey is an operation aimed at the collection of accurate data on the malaria situation which are essential for the drafting of a complete plan of operations for a malaria eradication programme

/ The pre-eradication

The pre-eradication survey ends when the plan has been prepared. No pre-eradication survey should be undertaken unless sufficient evidence exists that (i) the transmission of malaria can be interrupted by the use of methods commonly employed in malaria eradication; and (ii) basic operational facilities are available in the country.

(c) A malaria eradication pilot project is an operation intended to provide information as to whether certain single or combined antimalaria mesures will, if properly applied, bring about the interruption of transmission. Within this framework it might be possible, in a special type of field project, to study the most economical, effective and speedy ways in which to eradicate malaria.

(d) A pre-eradication programme is a preliminary operation undertaken in a country whose general administration and health services have not yet reached a level which would enable it to undertake a malaria eradication programme and in which, therefore, the necessary basic foundations for this kind of co-ordinated, thorough and time-limited activity have first to be laid. The operation must be planned and adapted to the socio-economic conditions and general developmental status of the country concerned.

(e) Malaria eradication training projects consist mainly in financial and technical support for the establishment and development of malaria eradication training centres with a properly organized field training area and with regular courses for senior and junior officials, and in the adequate provision of fellowships for national malaria staff.

(f) Malaria eradication field research projects are very special projects designed to find new ways and means of interrupting transmission where conventional methods have failed.

... The attached chart shows clearly the inter-relationship of the different types of malaria eradication country projects. The first qualifying element is the technical feasibility of interrupting transmission(1). When feasibility is proved, the second condition is that of the existence of operational facilities (1.1).

/ If the

If the latter are adequate, a pre-eradication survey can be undertaken (1.1.1) in which the plan for the subsequent malaria eradication programme (1.1.2) will be drawn up. An accessory contingency may be the need (according to the size of the future programme) for the establishment of a separate national malaria eradication training project (1.1.3).

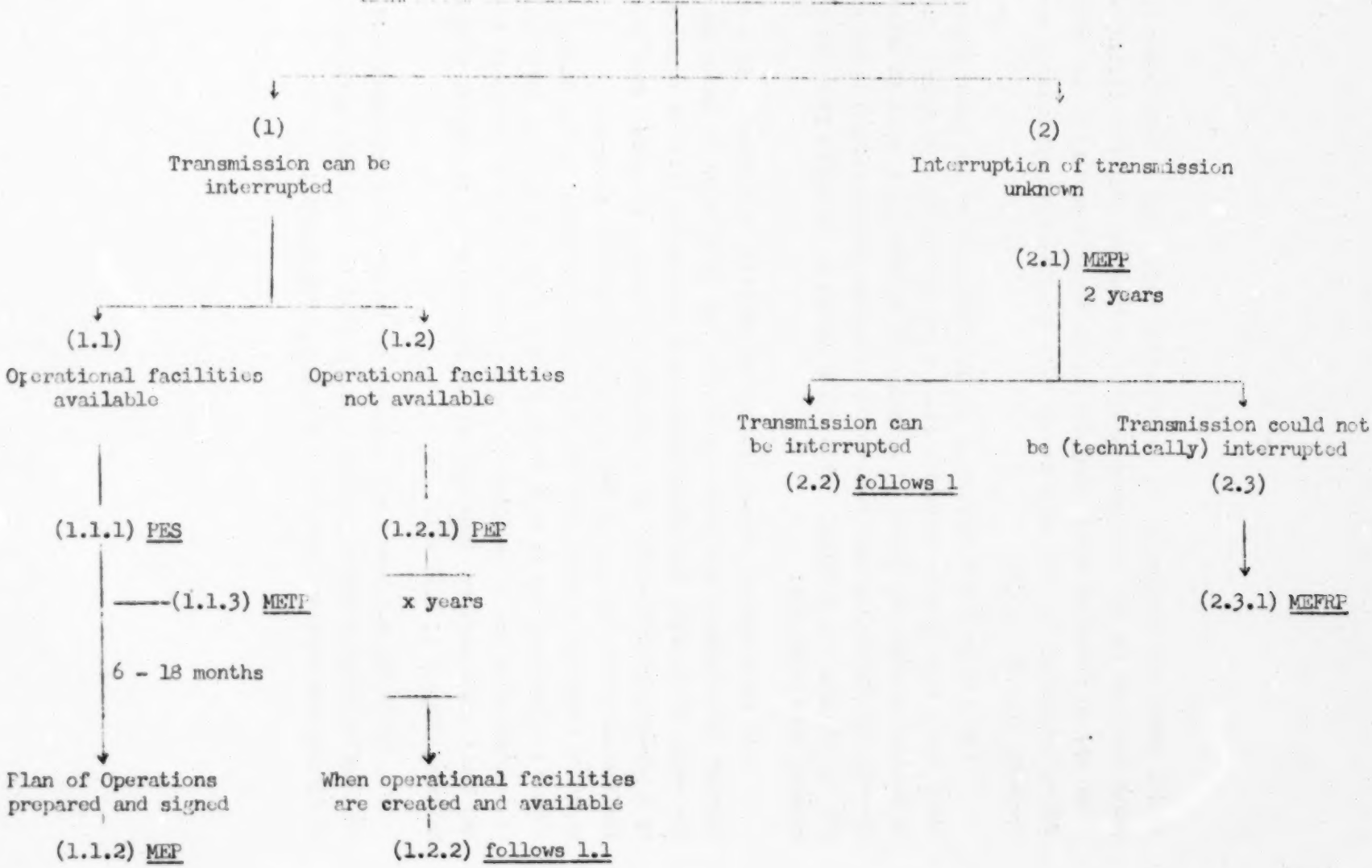
When operational facilities are not available or are below the permissible level for a country-wide operation (1.2) a pre-eradication programme (1.2.1) may be considered with the object of bringing the country to a state in which its operational facilities have reached the "aptitude level" (1.2.2) which justifies its eligibility for a malaria eradication programme through a pre-eradication survey, when necessary.

If the technical feasibility of interrupting transmission in a country is unknown (2) a malaria eradication pilot project (2.1) might be undertaken with the scope of checking that feasibility; when successful (2.2) it could be followed by a pre-eradication survey and a malaria eradication programme when operational facilities are available; otherwise a pre-eradication programme might be established until such facilities are developed. In the latter case the former project area may be kept "both for training purposes and with the object of demonstrating the organizational requirements of malaria eradication procedures and their administrative implication" (Eighth Report of the Expert Committee on Malaria, Chapter 6, 6.1, vi).

If it has not been found possible to interrupt transmission (2.3) a malaria eradication field research project (2.3.1) could be considered with the purpose of finding new ways and means of controlling transmission.

MALARIA ERADICATION COUNTRY PROJECTS ASSISTED BY WHO

Classification and inter-relationship



WORLD HEALTH ORGANIZATION

ORGANISATION MONDIALE DE LA SANTE

29 April 1960

MINIMUM PROVISIONS OF AN ACCEPTABLE PLAN FOR ERADICATION OF MALARIA

Though most malarious countries have accepted the objective of malaria eradication and many have progressed a long way toward this goal relatively few have carefully assessed at the outset the size of the problem and what additional effort and resources would be needed. The fact that so many programmes are in progress is a tribute more to widespread confidence in the effectiveness of the weapon (DDT) and the idea of participation in an international effort than to successes achieved as a result of good planning, careful execution, and adequate evaluation. If success is not achieved, however, the promoters will be called to account for any weakness in the basic planning, and WHO will not escape blame if it has failed to impress upon governments the danger of starting or continuing field operations with insufficient resources in men, materials, money, or management.

Before a government and the international agencies can agree upon a co-operative effort in terms of purposes, methods, and extent of each party's financial support the problem and its solution must be studied, evaluated, and put on paper. The resulting programme proposal must give convincing evidence of the feasibility of the work, the appropriateness of the methods and techniques chosen, and the overall cost. The details of such a proposal cannot of course be standardized but certain provisions are so basic that without them a plan cannot be considered sound. Once the proposal has been considered technically and administratively sound and once the government and co-operating agencies have agreed in principle on their collaboration and the kind and extent of their commitments, then the completed document will become a formal Plan of Operations. In the following paragraphs are described 22 minimum provisions of an acceptable plan upon which Regional Directors are authorized to give technical approval.

/PART I -

PART I - TECHNICAL REQUIREMENTS

1. What are the objectives?

The long-range objective of the plan is the elimination of malaria from the country and the prevention of its re-introduction. Intermediate objectives are completion of geographical, epidemiological, and entomological reconnaissance of the malarious areas, preparation of the population to accept and participate in the work, mobilization and training of forces for the attack, application of the chosen weapons and assessment techniques on a total coverage basis until malaria is eliminated, and prevention of the re-introduction of malaria into the country.

2. What methods will be used?

The principal method will be the spraying with residual insecticides of interiors of all those structures (generally human dwellings) where Anopheles mosquitos can feed on man or rest after feeding. The sprayings will be done at such dosage and intervals that resting Anopheles will be killed throughout all transmission seasons of the attack phase. Such operations will be accompanied by auxiliary measures to ensure correct, total, and timely applications, public co-operation, especially to prevent the reduction of the "protective surface", and adequate evaluation of results. In areas where malaria has yielded slowly to a thorough residual spraying, chemotherapy as an adjuvant measure may be proposed to speed up the interruption of transmission.

3. How and where has the feasibility of the methods been demonstrated?

It has been proved by a pilot project, by a control project, or by a programme in a neighbouring country, that the proposed insecticide, site of spraying, dosage, and frequency will stop malaria transmission in conditions of weather, housing, cultural habits, and malaria endemicity similar to those in the proposed programme area. If chemotherapy as an adjuvant method is proposed, definite proof of the success of this association is given.

/4. How adequate

4. How adequate as a basis for planning is the background information so far gathered?

From earlier morbidity and mortality records, from malariometric and entomological survey records, and from the results of the pre-eradication survey, the malarious areas of the country have been delimited, described, and plotted on maps, the vector species and other man-biting anophelines together with something of their resting habits are known, and the important geographical, climatic, social and economic information has been recorded for each political division of the country. The information given is sufficient (a) to designate the names and boundaries of the political divisions and subdivisions, (b) to designate geographical boundaries such as forests or elevations above sea level which have been related tc epidemiological features, (c) to delimit the malarious areas in terms of ground surface (sq km), (d) to calculate the populations to be covered, classified as rural, urban, and migrant, the urban populations being further classified according to whether their houses will be sprayed or protected by barriers, and all populations being identified by year of census or estimate, (e) to verify the numbers, types, and average sprayable surfaces of structures to be included in the spraying programme, (f) to verify the seasons chosen for spraying operations, in relation to transmission seasons, rainy seasons, times when houses are traditionally redecorated, etc., and (g) to justify the insecticide, dosage, frequency, and site of spraying chosen.

5. How are the phases of the programme spelled out?

The phases of the programme will be preparation, attack, consolidation, and maintenance, except that in a country or in areas of a country where the conditions for commencing the consolidation phase are met the attack phase will be eliminated. The programme will be undertaken simultaneously in all malarious areas of the country, or will be undertaken successively by stages in different areas of the country. In the latter case no area will enter the consolidation phase until the contiguous areas are at least in the second year of the attack

/phase, or

phase, or unless a physical barrier ensures a natural protection. The duration of the various phases is expected to be: preparation, 6-18 months; attack, 3-5 years; consolidation, 3 years; maintenance, indefinitely until elimination of malaria from the whole world. Their actual duration in practice will depend upon the fulfilment of the following criteria:

(a) The preparatory phase will end and the attack phase will begin in each operational area when epidemiological and geographical reconnaissance are complete, when central and periferal stations and essential services are established, when staff is recruited and trained, and when logistics and reporting systems have been organized. When indicated, a pilot spraying operation will be carried out during the preparatory phase to test the fitness of the set up.

(b) The attack phase will end and the consolidation phase will begin in each operational area when the epidemiological services confirm that the infant parasite rate is nil, that the number of malaria cases during the preceding twelve months is less than 0.05 per cent.of the population and that indigenous cases are nil, or else very low and confined to small, well-defined foci which can be effectively isolated. Confirmation that these conditions exist will be based upon detection activities covering the whole risk population of the area and resulting in a blood examination rate of at least one per cent of the population monthly during the transmission seasons.

Forecasts of materials and personnel will be based upon experience in the same or similar areas: if such experience has proved that transmission is stopped in the first year of spraying a three-year attack will be provided for. In any case the actual withdrawal of spraying will be conditioned upon satisfaction of the above criteria whether it occurs earlier or later than now foreseen.

(c) The consolidation phase will end and the maintenance phase will begin in each operational area when no indigenous cases have been

/discovered by

discovered by total coverage surveillance for three years in the last two of which spraying was withdrawn.

6. What legal basis has the programme?

Legal dispositions exist or acceptable assurance of their promotion is given for at least the following purposes: (a) to vest in one person or one group of persons the authority and responsibility for direction of the programme; (b) to create and define the terms of reference of a National Malaria Eradication Service; (c) to define specific areas of responsibility where directive and/or executive authority is shared in respect of the malaria eradication programme between different government agencies, for example, where funds are controlled by another agency of the government, setting up machinery for the prompt and efficient settlement of obligations, particularly in regard to payment of wages to field personnel, costs of distributing supplies, and maintenance of transport in full working condition; (d) to make mandatory the reporting to the Malaria Eradication Service any public works construction in originally or potentially malarious areas which might disrupt the malaria eradication programme; (e) to define special measures to promote and ensure public cooperation with the campaign operations, in particular, right of entry by service staff into structures designated for spraying or for epidemiological investigation, and compulsory reporting of suspected or confirmed malaria cases; (f) to provide adequate financial resources for the entire duration of the eradication programme; (g) to grant customs exemption for imported materials to be used for the programme.

7. What arrangements are made for financial management of the programme?

Whether or not appropriate legal dispositions have been effected, (a) the Director of the Malaria Service will receive allotments of the sums authorized for malaria activities and will control their obligation for the purposes for which they were budgeted, or (b) if funds are controlled by another agency of the government, machinery will be set up for prompt settlement of obligations.

/8. What arrangement

8. What arrangement is made for convening representatives of interested agencies?

In the event that different governmental or other agencies are involved in the malaria eradication programme and that a high echelon co-ordinating body may help the development of the programme, a national malaria board will be set up to formulate policy and if appropriate to exercise technical and administrative direction of the programme. Members will be the Ministers of Health and Finance (or the financing agency) or their representatives, Director of the Malaria Institute (if existing), and the Director of the Malaria Service who will act as Secretary to the Board. Senior malaria advisers of WHO and representatives of UNICEF and ICA (as applicable) will attend all meetings of the Board either as members or as advisers. The Board may include other interested ministries or agencies.

9. How is the Malaria Service constituted and what are its responsibilities?

The Malaria Service will be a primary division of the Health Ministry or Department. It will be made responsible for organizing and supervising field activities, for co-ordination with other governmental or outside agencies, and for advice on technical, administrative and social aspects of malaria eradication work. It will have main divisions responsible for spraying operations, epidemiological services (including entomology) and administration (finance, personnel, supply, communications, and transport). Provision will be made to hire all necessary auxiliary headquarters staff, and for purchasing or renting offices, stores, laboratories, garages, furniture, office machines, stationery, etc.

10. What professional direction is provided?

Professional direction of each of the technical divisions and subdivisions of the Malaria Service is assured by competent, regular, full-time officers who have either had or who will have the opportunity to attend an METC or to visit one or more operating eradication programmes. If the population living in malarious areas of the country exceeds one million, field operations will be directed by field units (zone offices) having professional direction, division of activities, auxiliary staff, facilities and equipment similar to those of

/headquarters and

headquarters and covering each a population of a million or less. Where the programme is to be implemented by stages provision will be made for setting up these field units approximately one year before the commencement of spraying operations to serve as bases for the preparatory work of geographical and epidemiological reconnaissance and training of spraying staff.

11. What is the staffing policy?

A staffing pattern covering both technical and administrative posts has been elaborated for the whole period of the active campaign, which allows adequate time for posting of vacancies, selection, recruitment, training and preliminary field experience. Pay, allowances, chances for promotion, and other conditions of service are such that good workers can be attracted to the Service. A job description, including duties to be performed, supervision received and given, and required levels of education, experience, and health, will be prepared before recruitment begins for each category of staff. The Director of the Service will play a leading role in recruitment of personnel and is allowed to apply disciplinary measures when required.

12. What are the supply services?

Provisions will be made to ensure that all parts of the organization receive correct, sufficient, and timely supplies. This service has facilities for ascertaining kinds, quantities, and dates of requirements, procuring, storing, distributing, and accounting. It maintains at headquarters, zones, and elsewhere as needed, dry, secure stores for all types of expendable and non-expendable supplies and equipment, especially insecticides.

13. What are the transport services?

Facilities exist or will be set up to service and repair all motor vehicles used by the Service at regular intervals and (if applicable) to train and control drivers. All vehicles will be subject to a programme of preventive maintenance. Sufficient records (including individual log-books for all vehicles) will be kept to verify that vehicles are correctly maintained, and that they are only used for authorized work related to the malaria eradication programme.

/14. What scientific

14. What scientific guidance is foreseen?

Scientific guidance for the programme will be provided through co-operation with the Malaria Institute (if existing) and the WHO advisers. This co-operation includes provision of evaluation and training facilities, as appropriate.

15. What plans are made to promote co-operation of the public?

Arrangements are made to promote public information and education through establishment of a special office in the Malaria Service or through co-operation with the relevant services of the Health and Education Ministries. With assistance from WHO as necessary a detailed programme of public information and education will be elaborated.

16. Is the design data complete and correct?

Operational centres and areas (zones) have been designated and shown on maps. These sizes and boundaries of the operational areas were based on a study of the country's political, geographical, and malarious regions, as well as distribution of population and routes of communication. For each operational area the following information has been determined:

(a) Size of malarious area (km^2)

(b) Year and month total coverage spraying will be started, its expected duration in years, and the expected number of spraying cycles which will be effected (see section 5(b) above).

(c) Populations to be covered each year of spraying, based on census or estimate, annual increase up to the first year of total coverage, and (if expected to be different due to influx of settlers, etc.) annual increase thereafter[1]. The population to be covered is classified as fixed and migrant.

(d) Average sprayable surface per structure, or for each type of structure differentiated for operational convenience.

(e) Number of structures (or number of each type of structure) to be sprayed each year, based on the same annual increase assumed for population.

(f) Insecticide, formulation(s), dosage, cycle, and site of application.

(g) Timing of spraying operations.

/17. What are

[1] $P_2 = P_1 (1+r)^t$ where P is population, r is annual rate of increase, and t is years elapsed.

17. What are the plans for spraying operations?

Spraying operations will be carried out using the insecticides, dosages, frequencies, and techniques of application recommended by the Expert Committee on Malaria and the Malaria Eradication Division. The plan includes clear and specific provisons for carrying out the geographical reconnaissance, for setting up and maintaining and efficient organization, and for ensuring total coverage through adequate supervision and an effective reporting system. The methods used are aimed at total interruption of transmission in the absence of unforeseeable technical impediments. Spraying once begun in a given area will be continued until the criteria for its withdrawal mentioned in section 5 have been fulfilled.

The organization is led by a competent chief of spraying operations - preferably an engineer - experienced in getting jobs done. In a country of a million or less risk population he may oversee directly the spraying operations; where professionally staffed operational zones are established, each zone has a chief of spraying operations who is administratively responsible to the zone chief but who received technical direction from the chief engineer. The lines of communication are clear and rapid between the chief engineer and each sprayman in the field.

If no preparatory work has been done, up to 18 months will be allowed for completing arrangements for the spraying campaign. This will include production of large-scale maps[1/] of all operational areas; hiring and training of geographical reconnaissance staff; geographical reconnaissance of all villages in operational areas, including numbering houses, posting cards, recording village data, and if required taking census, measuring houses and making a village sketch; training in spraying techniques; setting up field centres and stores; hiring and training of spraymen. For the geographical reconnaissance at least 160 man-months of reconnaissance agents will be provided per million population covered.

Enough spraymen will be hired to cover the area foreseen in the time foreseen, allowing for delays due to transportation difficulties, rainy seasons, closed houses and refusals. At least a week of training is given to all new

/spraymen.

1/ For population densities up to 10 per km^2 1:200,000 is adequate, for densities of 10-50 per km2 1:100,000 may be used, for higher densities 1:50,000 is preferable.

spraymen. The workrate given has been tried out in this country, or if not is based on workrates in eradication programmes in similar conditions. One sprayer will be allowed per spraymen and a reserve of 20-25 percent will be kept on hand; in addition, nozzles, and spare parts will be kept in stock in field stores at all times. Spraymen are provided uniforms, head covering, mixing buckets and paddles. Emphasis is put on good training and individual responsibility for good work.

Spraymen are grouped into squads so as to achieve the maximum operational and supervisory efficiency. No more than six spraymen will work under one squad leader. Where houses are very scattered spraymen will work in groups of 2 or 3, one of them acting as squad leader in addition to spraying. To fix clearly the responsibility for total coverage each squad will work in an assigned area and follow a pre-determined itinerary. Normally a supervisor will visit every squad at least once per week, the number of squads under his control depending upon the accessibility of villages in his area. If a zone spraying chief has more than ten supervisors he will have in addition an appropriate number of senior supervisors.

Operations manuals describing the duties and responsibilities of all members of the spraying staff have been prepared or will be prepared in time for use in training.

Written reports of work accomplished and materials and time expended will be required from spraying teams daily and weekly. Reporting forms will be simple, accurate, rapidly processed, and rapidly acted on. Originally field records with appropriate endorsements will be transmitted to zone officers or to headquarters. The reporting procedure is especially designed to expose structures left unsprayed.

Insecticide requirements are estimated for each year of the programme, with a 10 percent allowance in the first year for the unexpected, and approximately one year extra calculated to be used for focal spraying during the consolidation phase. Purchase of insecticides is foreseen in the year before they are needed.

Realistic provisions for transport are made, taking into account who and what has to be moved, how far and when it has to go. All motor vehicles for the

/eradication programme

eradication programme are four-wheel drive utility vehicles with heavy-duty springs, shocks absorbers and tires, safety glass windows, air, oil, and fuel filters, and service facilities in the country. A stock is kept of necessary replacement parts not available in the local market. Periodic transport of insecticides between centres will as much as possible be made with public transport; heavy trucks will be acquired by the service only where they can be fully justified[1]. Supervisors will have individual transport suitable to their area of work. One reserve vehicle is provided for every ten in operation to prevent work stoppages.

18. What are the plans for epidemiological operations?

Epidemiological operations will be carried out throughout the programme. In the preparatory phase an evaluation service will be built up to establish epidemiological/entomological base-line data on which the progress of the programme can be assessed. In the early part of the attack phase epidemiological evaluation will measure the initial reduction in transmission, certify the subsequent interruption of transmission and the maintenance of interruption while the parasite reservoir is still partly filled, and detect and analyse all departures from the expected course of events. At this stage the gradual strengthening of case-detection activities will form the basis of the later surveillance operations. In the later part of the attack phase case detection operations and entomological studies will determine the correct time to discontinue spraying in each area. In the consolidation phase total coverage surveillance operations will find and eliminate residual foci and substantiate the claim that eradication has been achieved. During the maintenance phase, although the regular malaria eradication service may have been disbanded, provision will be made for vigilance, and emergency actions in case of re-introduction of malaria.

Headquarters has an epidemiological unit with at least one malariologist-epidemiologist, one entomologist, and one parasitologist. Where professionally-staffed field units (zones) have been established the epidemiological work will be directed by a malariologist-epidemiologist responsible to the zone chief or

/where he

1/ Biannual coverage of a million people with 75% DDT wdp on a year round basis means delivering only 5 tons per week.

where he is unavailable by an experienced subprofessional public health officer. The zone office will include an entomologist. An efficiently planned laboratory service under the epidemiological unit will be provided from the beginning of the programme to last for its entire duration. Its organizational structure will guarantee reliable examination of all collected blood smears in the shortest possible time.

Staff of epidemiological operations will reach a maximum in the later part of the attack phase when surveillance is instituted. From the beginning of the programme, however, workable provision will be made, through education of the public to enlist the support and co-operation of medical, paramedical and lay persons who may later man the posts of passive case detection. During the early years, different schemes for dividing responsibility for case detection between medical services, lay persons, and the Malaria Eradication staff will be tried out. In the absence of passive case detection the number of active surveillance agents has been calculated at the workrate of about 40 houses per working day or 1000 houses per month. In addition, whether active or passive case detection methods or both are in use a certain number of supervisors and senior supervisors are provided. A supervisor will be provided for not more than 5 surveillance agents or, for areas covered by passive case detection, not more than 25.000 population. At least 10 microscopists will be provided per million persons covered each having a compound binocular microscope. For each laboratory and for each ten microscopists one senior microscopist will be provided to supervise the work and to check positive slides and a proportion of negative slides. Each zone entomologist will be assisted by an appropriate staff which might consist of a laboratory technician, two field technicians, and four insect collectors.

During the preparatory and the early part of the attack phase, malariometric surveys will be made mostly to determine parasite rates, especially in infants. In planning and reporting surveys due care will be taken to get adequate samples from representative or indicator areas. During this period entomological studies will be made to confirm the vector and its distribution, its susceptibility, and its resting and biting habits. From the early part of

/the attack

the attack phase entomological studies will be made to confirm the absence of vectors from sprayed surfaces, and to seek the cause if there is evidence that a vector is insufficiently under control. From the later part of the attack phase through the consolidation phase surveillance will be fully instituted on a total coverage basis. This implies maximum efficiency of passive and active case detection covering the entire area under consolidation as well as the use of any other possible case detection methods; suppressive treatment of all fever cases and radical treatment of all confirmed cases with antimalarial drugs; epidemiological investigation of all confirmed cases and their surroundings including entomological studies, with the purpose of establishing the origin and causes; case follow-up; elimination of residual foci by insecticide spraying or administration of antimalarial drugs or both; and establishment of case registration and a well-planned reporting system.

About $5000 per year has been foreseen for drugs and laboratory supplies for the epidemiological services per million risk population. Motor transport for professional epidemiological staff is provided, motorcycles or motor bicycles (as appropriate) for surveillance supervisors. Surveillance agents in most cases need no transport, but where a bicycle is usable it is provided.

19. Are costs correctly calculated and reasonable?

All costs through the end of the consolidation phase (other than salaries, allowances and statutory travel of international advisers) have been estimated and tabulated so as to show the bases for estimation (quantities, unit prices, numbers of each category of staff, wages, allowances, duration of employment, etc.). All imported supplies and equipment have been costed in the year preceding that in which they will be used and a factor of 20-25% for packing, freight, and insurance has been added. Expenses have been classified under the heading: personnel and training; capital assets such as vehicles, microscopes, etc; expendable supplies; and other costs such as rents, utilities, facilities for international advisers, etc. Due account is taken of expected depreciation of sprayers and vehicles: where sprayers are in use for one cycle per year, 20% value per annum

/in spare

in spare parts is allowed, but no new sprayers; where they are in use throughout the year replacement of half of them is foreseen during the attack phase; from the fifth year of use onwards provision is made for replacing 25% of the original vehicles each year, with similar vehicles or with other types more adapted to the surveillance operations.

20. What is the proposed distribution of costs?

Committed and forecasted government funds for the programme and estimated contributions from international and bilateral sources are shown by year up to the end of the consolidation phase, covering all the expenses shown in section 19. The Government proposes to continue any existing provision under the UN programme of Technical Assistance for malaria services.

/PART II -

PART II - ADMINISTRATIVE REQUIREMENTS

21. General

The text of the plan of operations conforms in all administrative and legal aspects with that of the model agreement set forth in Annex C of Manual X.2. It covers the entire duration of WHO assistance and includes paragraph 12 of Part IX regardless of the source of funds from which WHO assistance is provided.

22. Commitments of WHO

(a) WHO participation has been foreseen in line with the established priorities:

(1) advisory services;

(2) training;

(3) research;

(4) supplies and equipment; and exceptionally

(5) assistance with local costs.

It is understood that participation in local costs will always require Headquarters approval.

(b) The commitments of WHO as from the date of commencement of WHO assistance, in respect of personnel, fellowships and supplies and equipment conform with the budgetary provisions; otherwise the prior approval of the Director-General has been obtained.

(c) The commitments of WHO for each year of the duration of WHO assistance are set out in detail by fund, it being understood that any changes subsequently found necessary and provided for in any revised budget estimates will be the subject of addenda.